REMARKS

Claims 1-46 are pending in this application.

In the Office Action, the Examiner rejected claims 1-46 under 35 U.S.C. Section 103(a) as being obvious over Randle (US Patent No. 6,263,047) in view of Lechleider (US Patent No. 6,091,713). Applicants respectfully traverse the rejection.

Conventionally, to determine whether a communication line is suitable for DSL service, a service technician had to have access to **both ends of a physical line**, having one technician transmit a signal at one end of the line, and having the other technician receive the signal at the other end, and then analyzing the received signal. As one can imagine, this entire process is time consuming, labor intensive and costly.

According to the present invention, however, an indirect method of qualifying a line for DSL service using a single end of the line is taught. A plant map (loop configuration) of the communication line is determined from measurements obtained through such instruments as a TDR at one end of the loop without requiring any test device at the other end of the loop. A transfer function (insertion loss) is derived from the plant map. The transfer function is then analyzed to determine whether the loop can support a DSL service.

This feature is recited in claim 1 as "measuring . . . at **one end** of the at least one communication line", "determining a plant map of the at least one communication line", "determining a

transfer function representative of the plant map", and "analyzing the transfer function so as to qualify the at least one communication line." As can be appreciated, the single ended testing feature of the present invention provides many advantages including substantial cost savings and efficient testing.

The Examiner cited Randle as disclosing every limitation of claim 1 except that it does not show determining the suitability of a communication line for xDSL. Applicants respectfully disagree.

Randle is directed to voice telephony service. As a result, it is solely concerned with determining the number of load coils that should be present in a properly loaded telephone line and positionally detecting which load coils are missing. (Column 2, lines 11-14). Applicants submit that qualifying a loop for voice service as disclosed in Randle is completely different from qualifying for a DSL service.

The voice band operates between 0-4 KHz and a typical DSL operates at a much higher frequency band such as from 25 KHz to 160 KHz upstream and 240 KHz to 1.5 MHz downstream. Because the DSL service operates at a much higher and non-overlapping frequency range from that of voice service, the present invention is not interested in finding the number of load coils or in locating where the load coils are. In fact, the very presence of even one load coil is sufficient to disqualify the line for DSL use at the beginning of the qualification test. As such, the

teachings of Randle concerned with voice telephony service cannot be applied to the present invention.

The Examiner stated that Figures 5A-5B, 7, 8A-8B and 12 of Randle disclose "determining a transfer function representative of the plant map". Applicants again respectfully disagree.

All figures cited by the Examiner are simply a plot of return output signals as a function of frequency. By contrast, claim 1 requires a "transfer function representative of the plant map" which is very different from the output signal curve of Randle. The output signal curve of Randle is performed by the first step in claim 1 of the present invention, which is simply a characteristic parameter of the communication line. By definition, a transfer function is a term of art and it means a complex function, $H(f)$, equal to the ratio of the output to input of the communication line as a function of frequency. The input signal, output signal (as shown by Randle) and transfer function are related in that if any two are known, then the third can be derived.

Moreover, deriving a transfer function is no easy task. As discussed in the specification at page 11, line 34 to page 12, line 1, circuit modeling software such as SPICE is needed to simulate the equivalent circuit components of the plant map which is then used to generate the transfer function of the line. None of the cited references teach or disclose determining a transfer

function representative of the plant map of the communication line as claimed in claim 1.

The Examiner cited Lechleider as disclosing the "importance of using existing copper line when deploying xDSL services" (page 3, last paragraph) and "estimating the noise that an xDSL or other broadband signal will encounter from external sources". (page 4, first full paragraph). Although applicants agree with the Examiner that existing copper lines can be used to deploy xDSL services, applicants disagree that Lechleider teaches single ended testing of xDSL signal as required in claim 1. In fact, Lechleider teaches away from the single ended testing feature of the present invention.

As taught by Lechleider, the testing device requires a modem device on **both ends** of the line. Specifically, a first modem 103 is connected to the subscriber end of the line and a second modem 113 is connected to the central office end of the line (col. 4, lines 40-66). Thus, even if Lechleider can be combined with Randle, the combination still does not produce the invention as claimed because the combination requires direct two-ended testing. By contrast, claim 1 is directed to a "single ended analysis" and recites "measuring . . . communication line to be tested **at one end** of the at least one communication line". As discussed above, the Lechleider method of requiring testing devices under the tester's control on both ends of the line is a

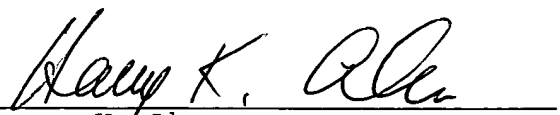
very expensive, time consuming and inefficient way of qualifying the lines for DSL service.

Similarly, independent claims 23 and 38 are also directed to a "single ended qualification of communication lines". Claim 23 recites "the receiving means being operatively connected to **one of a CO end and a CPE end of the communication line**". Claim 38 recites "a receiver operatively connected **to one end of a communication line**". None of the cited references teach or disclose single ended qualification of communication lines for xDSL.

Dependent claims 2-22, 24-37 and 39-46 are also patentable by virtue of their dependency from respective independent claims 1, 23 and 38.

Based upon the above amendments and remarks, applicants respectfully request reconsideration of this application and its early allowance. Should the Examiner feel that a telephone conference with applicants' attorney would expedite prosecution of this application, the Examiner is urged to contact him at the number indicated below.

Respectfully submitted,



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